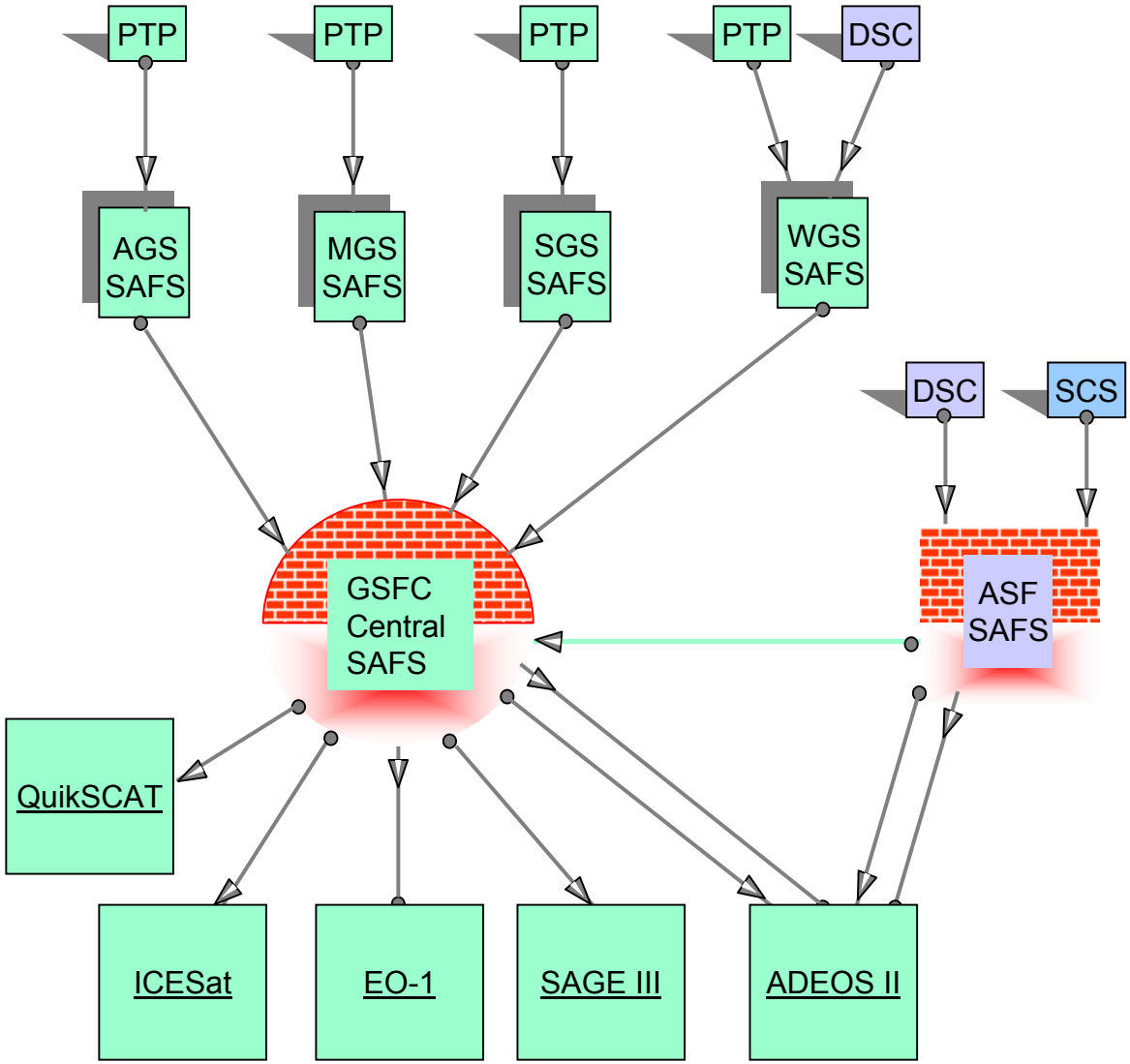
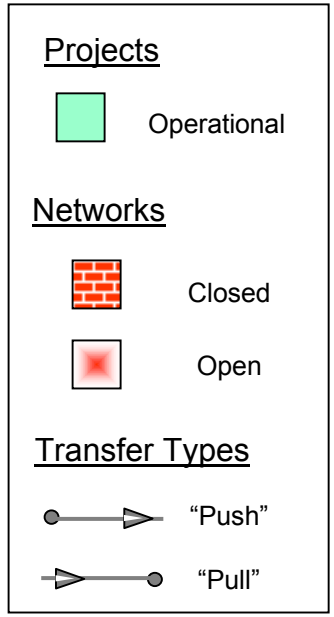
SAFS Configuration -- 2003-07-03





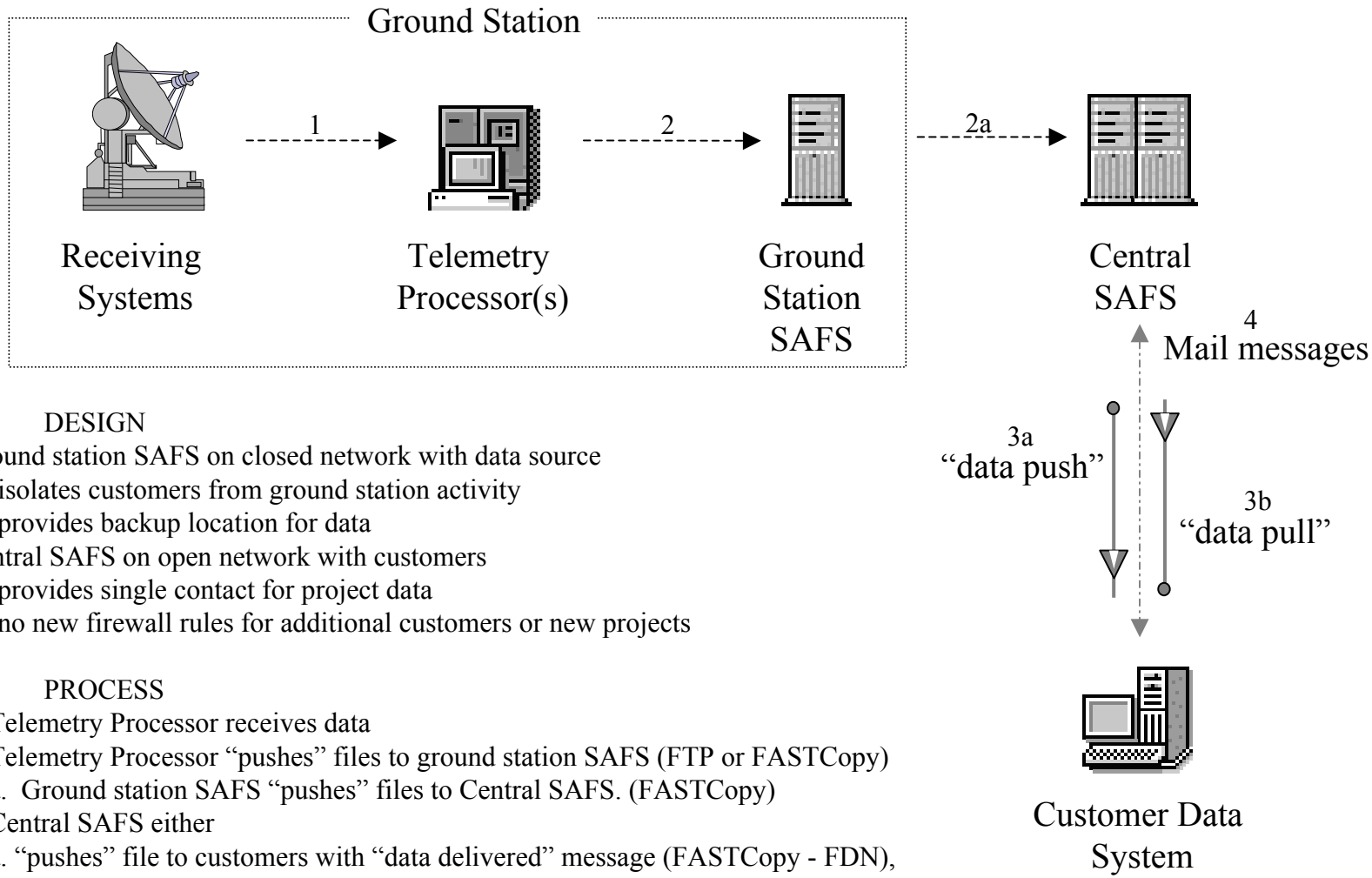
Not all projects implemented and/or proposed for the SAFS are shown, just enough to get a general feel.

SAFS: COTS Advantages

- Guaranteed file delivery
- Recovery from point of failure
- Stop/resume transmission control for priority transfers
- Programmable network bandwidth (adjustable transmission rates)
- On-the-fly compression
- File transfer security
- Multi-platform support provides standardization
- On-line network monitoring
- Shorter development time
- Application interface for automated tasks, and pre- and post-transfer processing.

FASTCopy - www.softlinkusa.com

Ground Station SAFS Data Transfer Model



DESIGN

Ground station SAFS on closed network with data source
- isolates customers from ground station activity
- provides backup location for data

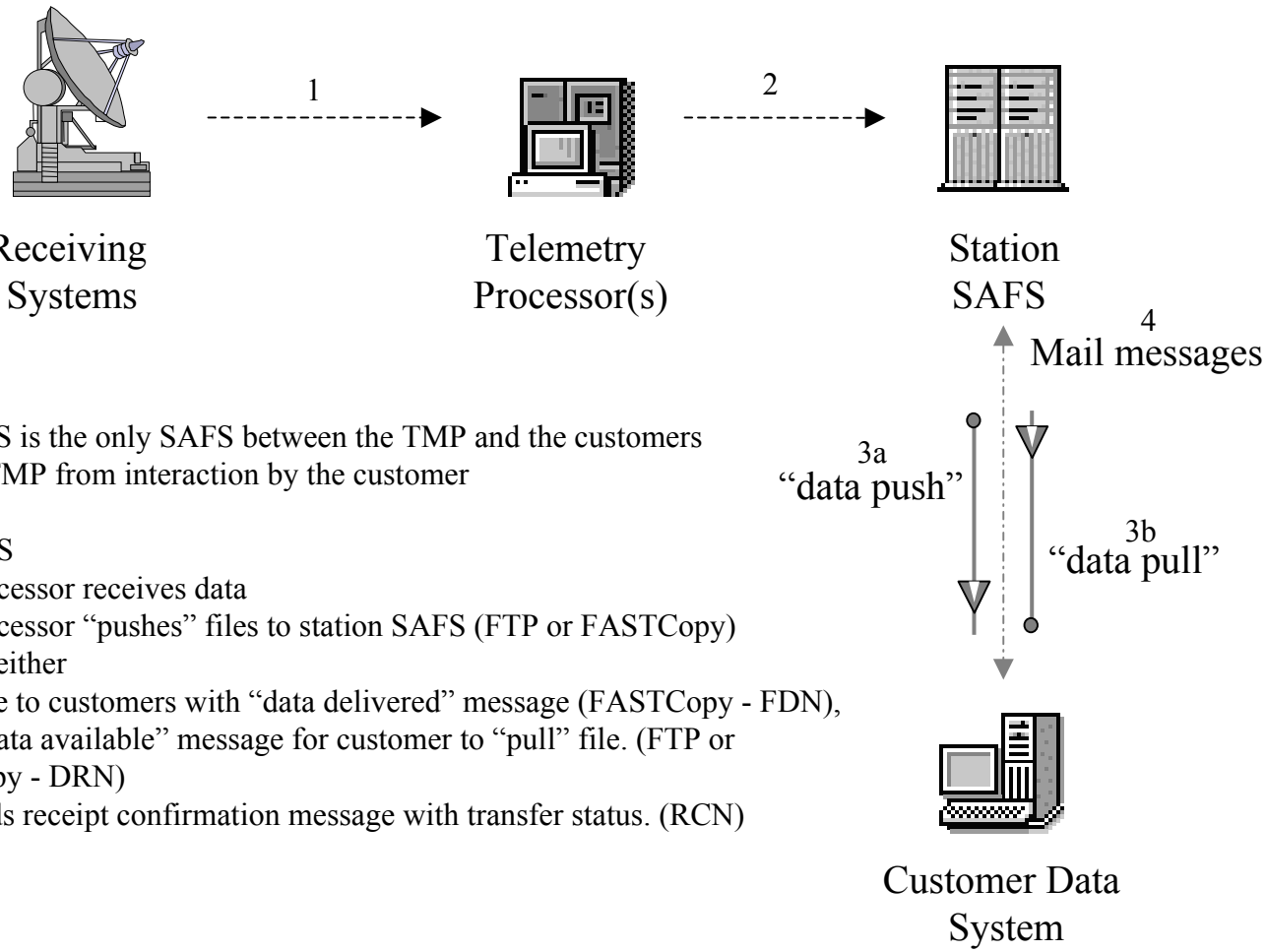
Central SAFS on open network with customers
- provides single contact for project data
- no new firewall rules for additional customers or new projects

PROCESS

1. Telemetry Processor receives data
2. Telemetry Processor "pushes" files to ground station SAFS (FTP or FASTCopy)
   a. Ground station SAFS "pushes" files to Central SAFS. (FASTCopy)
3. Central SAFS either
   a. "pushes" file to customers with "data delivered" message (FASTCopy - FDN),
   b. or sends "data available" message for customer to "pull" file. (FTP or FASTCopy - DRN)
4. Customer sends receipt confirmation message with transfer status. (RCN)

July 3, 2003

ASF: Station SAFS Data Transfer Model



DESIGN

The Station SAFS is the only SAFS between the TMP and the customers
- isolates the TMP from interaction by the customer

PROCESS

1. Telemetry Processor receives data
2. Telemetry Processor "pushes" files to station SAFS (FTP or FASTCopy)
3. Station SAFS either
   a. "pushes" file to customers with "data delivered" message (FASTCopy - FDN),
   b. or sends "data available" message for customer to "pull" file. (FTP or FASTCopy - DRN)
4. Customer sends receipt confirmation message with transfer status. (RCN)

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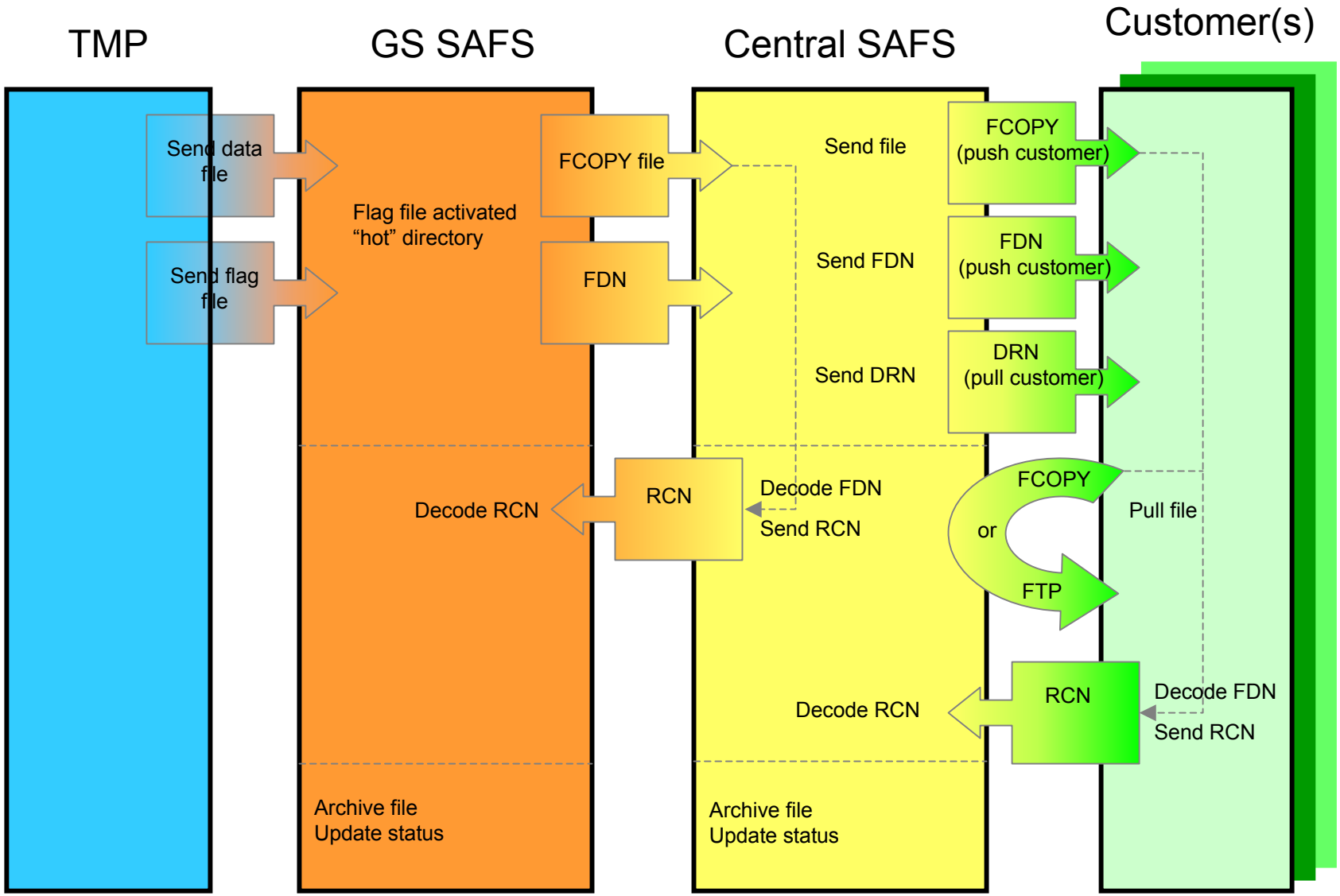
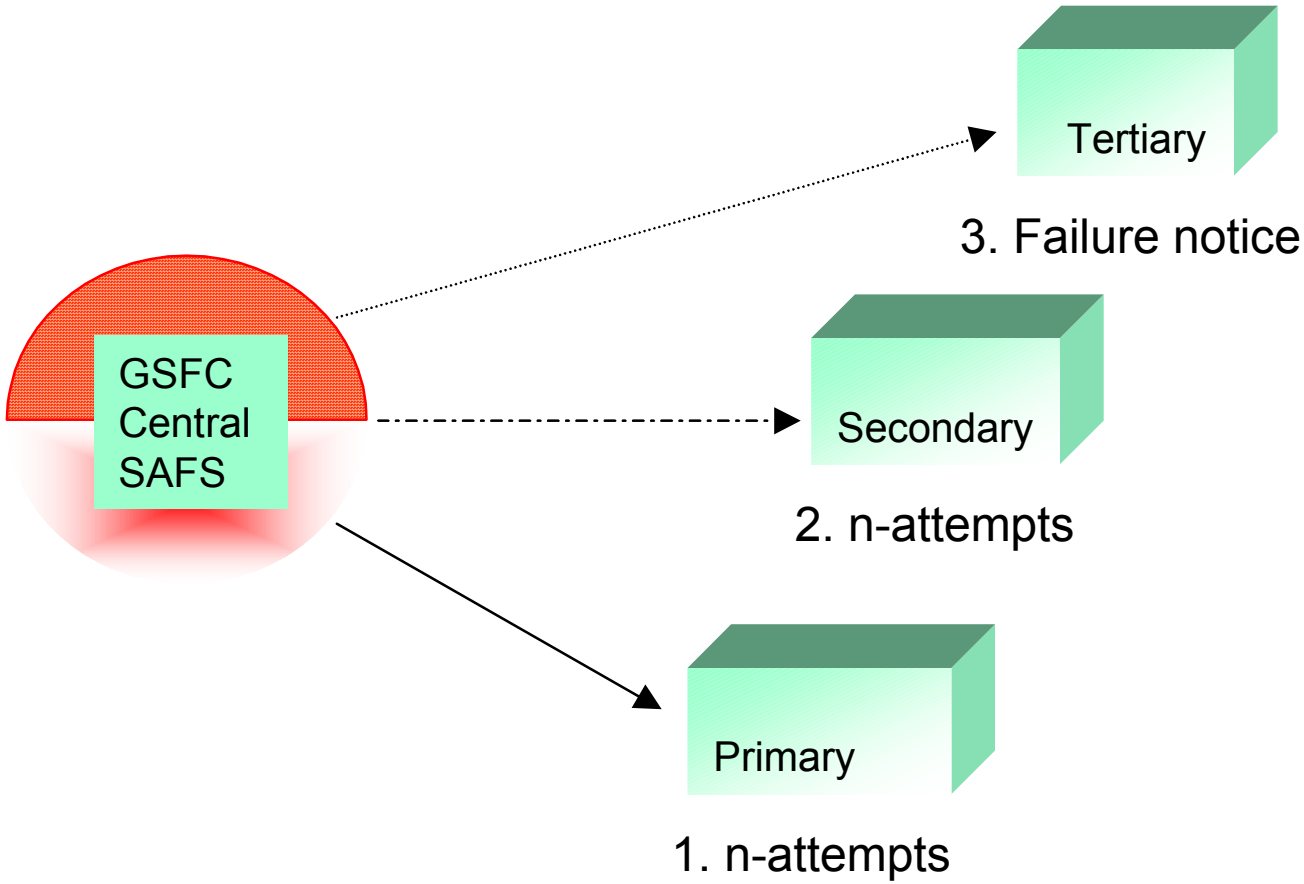
SAFS: File Transfer Logic

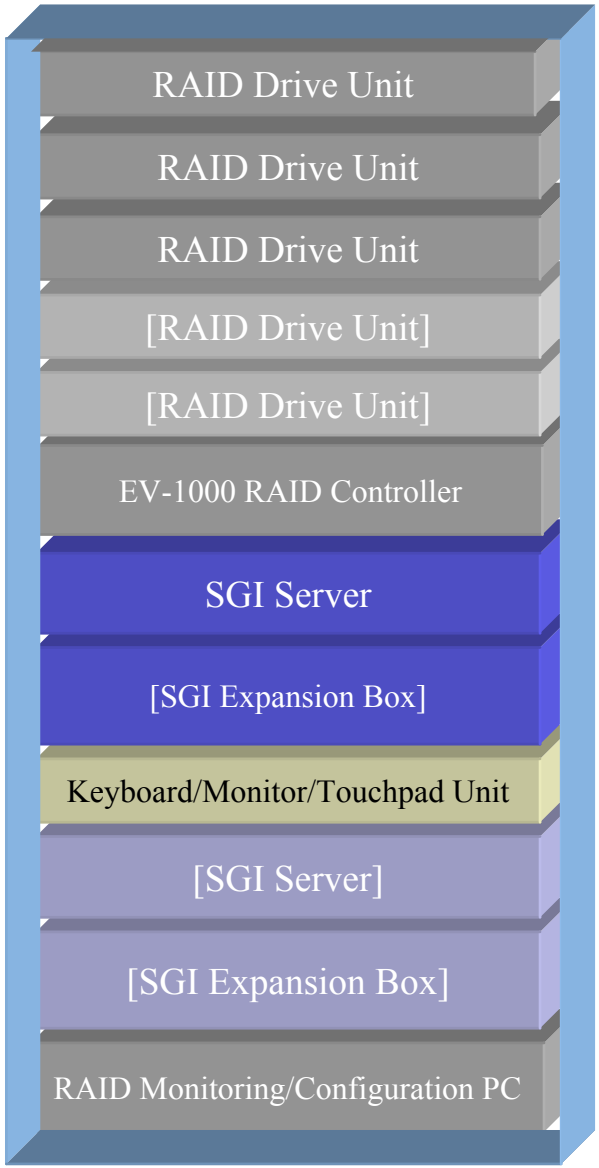


SAFS: Failover "Push" Option



Customer Systems

SAFS: System Components



Current hardware configurations:

Ground Station SAFS (AGS, MGS, SGS, WGS)
- DataDirect Networks EV-1000 RAID drive system
- SGI Origin 200 server(s) with one Ethernet card
- Industrial Computer Source keyboard/monitor/touchpad unit

Central SAFS (GSFC)
- DataDirect Networks EV-1000 RAID drive system
- SGI Origin 2000 server with two Ethernet cards
- Industrial Computer Source keyboard/monitor/touchpad unit

Non-Ground Station SAFS (ASF)
- DataDirect Networks EV-1000 RAID drive system
- SGI Origin 200 server(s) with four Fast Ethernet cards
- SGI Expansion Box(es)
- Industrial Computer Source keyboard/monitor/touchpad unit

Current software configurations:

All SAFS systems
- FASTCopy 2.5 software from Softlink, Inc.
- IRIX 6.5 operating system
- Custom shell scripts
- Custom C programs

July 3, 2003

ASF SAFS Rack

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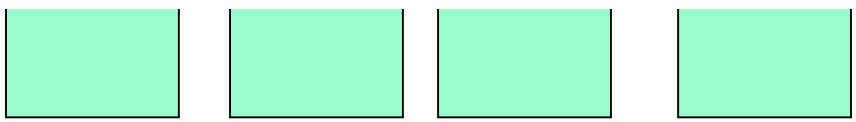
SAFS Overview

- Standard
- Autonomous
- File Server
- Requirement: Ensured Delivery of Data
- Requirement: Low Data Latency
- The Firewall Challenge



Reasons for Success

- Research Requirements
- Remain Firm on Requirements
- Planning for Future Needs
- Willingness to Pay Costs Early On To Save Later
- Opens Source and COTS Products
- Relationships with People
- Firm But Polite: Don’t Be A Punk

Problems Overcome

- ADEOS II Requirements (DRN, Priority)
- QuikSCAT Requirements (Latency)
- EO-1 (naming convention)
- We Want Access – Limited Accounts, Web
- Security
- Swap Space Problem
- Legacy Missions

Costs Saved

- Maintenance Cost
- Initial Outlay (Also Reduces Maintenance)
- Resisting Design Creep: Don't Make Coffee
- Post-Transition Savings: Brainstorm, Don't Cave In!
- It's All About Making the Effort to Plan
- Again: It's Worth the Effort, Don't Skimp